

SEQUENCE LISTING

<110> United States Army Medical Research Institute of
Infectious Diseases
Hart, Mary Katherine
Wilson, Julie A.
Pushko, Peter
Smith, Jonathan F.
Schmaljohn, Alan L.

<120> Ebola Virion Proteins Expressed from Venezuelan Equine Encephalitis (VEE)
Virus Replicons

<130> Army 144

<140> US Ser. No. 09/337,946

<141> 1999-06-22

<150> US 60/091,403

<151> 1998-06-29

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35 40
Ser Thr Leu Gln Val Ser Asp Val Asp Lys
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Ala Gly Glu Trp Ala Glu Asn Cys Tyr Asn
105 110
Leu Glu Ile Lys Lys Pro Asp Gly Ser Glu
115 120

Cys Leu Pro Ala Ala Pro Asp Gly Ile Arg
 125 130
 Gly Phe Pro Arg Cys Arg Tyr Val His Lys
 135 140
 Val Ser Gly Thr Gly Pro Cys Ala Gly Asp
 145 150
 Phe Ala Phe His Lys Glu Gly Ala Phe Phe
 155 160
 Leu Tyr Asp Arg Leu Ala Ser Thr Val Ile
 165 170
 Tyr Arg Gly Thr Thr Phe Ala Glu Gly Val
 175 180
 Val Ala Phe Leu Ile Leu Pro Gln Ala Lys
 185 190
 Lys Asp Phe Phe Ser Ser His Pro Leu Arg
 195 200
 Glu Pro Val Asn Ala Thr Glu Asp Pro Ser
 205 210
 Ser Gly Tyr Tyr Ser Thr Thr Ile Arg Tyr
 215 220
 Gln Ala Thr Gly Phe Gly Thr Asn Glu Thr
 225 230
 Glu Tyr Leu Phe Glu Val Asp Asn Leu Thr
 235 240
 Tyr Val Gln Leu Glu Ser Arg Phe Thr Pro
 245 250
 Gln Phe Leu Leu Gln Leu Asn Glu Thr Ile
 255 260
 Tyr Thr Ser Gly Lys Arg Ser Asn Thr Thr
 265 270
 Gly Lys Leu Ile Trp Lys Val Asn Pro Glu
 275 280
 Ile Asp Thr Thr Ile Gly Glu Trp Ala Phe
 285 290
 Trp Glu Thr Lys Lys Asn Leu Thr Arg Lys
 295 300
 Ile Arg Ser Glu Glu Leu Ser Phe Thr Val
 305 310

Val Ser Asn Gly Ala Lys Asn Ile Ser Gly
 Gln Ser Pro Ala Arg Thr Ser Ser Asp Pro
 325 330
 Gly Thr Asn Thr Thr Thr Glu Asp His Lys
 335 340
 Ile Met Ala Ser Glu Asn Ser Ser Ala Met
 345 350
 Val Gln Val His Ser Gln Gly Arg Glu Ala
 355 360
 Ala Val Ser His Leu Thr Thr Leu Ala Thr
 365 370
 Ile Ser Thr Ser Pro Gln Ser Leu Thr Thr
 375 380
 Lys Pro Gly Pro Asp Asn Ser Thr His Asn
 385 390
 Thr Pro Val Tyr Lys Leu Asp Ile Ser Glu
 395 400
 Ala Thr Gln Val Glu Gln His His Arg Arg

315

320

	405		410
Thr Asp Asn Asp Ser Thr Ala Ser Asp Thr			
	415		420
Pro Ser Ala Thr Thr Ala Ala Gly Pro Pro			
	425		430
Lys Ala Glu Asn Thr Asn Thr Ser Lys Ser			
	435		440
Thr Asp Phe Leu Asp Pro Ala Thr Thr Thr			
	445		450
Ser Pro Gln Asn His Ser Glu Thr Ala Gly			
	455		460
Asn Asn Asn Thr His His Gln Asp Thr Gly			
	465		470
Glu Glu Ser Ala Ser Ser Gly Lys Leu Gly			
	475		480
Leu Ile Thr Asn Thr Ile Ala Gly Val Ala			
	485		490
Gly Leu Ile Thr Gly Gly Arg Arg Thr Arg			
	495		500
Arg Glu Ala Ile Val Asn Ala Gln Pro Lys			
	505		510
Cys Asn Pro Asn Leu His Tyr Trp Thr Thr			
	515		520
Gln Asp Glu Gly Ala Ala Ile Gly Leu Ala			
	525		530
Trp Ile Pro Tyr Phe Gly Pro Ala Ala Glu			
	535		540
Gly Ile Tyr Ile Glu Gly Leu Met His Asn			
	545		550
Gln Asp Gly Leu Ile Cys Gly Leu Arg Gln			
	555		560
Leu Ala Asn Glu Thr Thr Gln Ala Leu Gln			
	565		570
Leu Phe Leu Arg Ala Thr Thr Glu Leu Arg			
	575		580
Thr Phe Ser Ile Leu Asn Arg Lys Ala Ile			
	585		590
Asp Phe Leu Leu Gln Arg Trp Gly Gly Thr			
	595		600
Cys His Ile Leu Gly Pro Asp Cys Cys Ile			
	605		610
Glu Pro His Asp Trp Thr Lys Asn Ile Thr			
	615		620
Asp Lys Ile Asp Gln Ile Ile His Asp Phe			
	625		630
Val Asp Lys Thr Leu Pro Asp Gln Gly Asp			
	635		640
Asn Asp Asn Trp Trp Thr Gly Trp Arg Gln			
	645		650
Trp Ile Pro Ala Gly Ile Gly Val Thr Gly			
	655		660
Val Val Ile Ala Val Ile Ala Leu Phe Cys			
	665		670
Ile Cys Lys Phe Val Phe			
	675		

<211> 739

<212> PRT

<213> Ebola Zaire

<400> 18

Met	Asp	Ser	Arg	Pro	Gln	Lys	Ile	Trp	Met	
1				5					10	
Ala	Pro	Ser	Leu	Thr	Glu	Ser	Asp	Met	Asp	
				15					20	
Tyr	His	Lys	Ile	Leu	Thr	Ala	Gly	Leu	Ser	
				25					30	
Val	Gln	Gln	Gly	Ile	Val	Arg	Gln	Arg	Val	
				35					40	
Ile	Pro	Val	Tyr	Gln	Val	Asn	Asn	Leu	Glu	
				45					50	
Glu	Ile	Cys	Gln	Leu	Ile	Ile	Gln	Ala	Phe	
				55					60	
Glu	Ala	Gly	Val	Asp	Phe	Gln	Glu	Ser	Ala	
				65					70	
Asp	Ser	Phe	Leu	Leu	Met	Leu	Cys	Leu	His	
				75					80	
His	Ala	Tyr	Gln	Gly	Asp	Tyr	Lys	Leu	Phe	
				85					90	
Leu	Glu	Ser	Gly	Ala	Val	Lys	Tyr	Leu	Glu	
				95					100	
Gly	His	Gly	Phe	Arg	Phe	Glu	Val	Lys	Lys	
				105					110	
Arg	Asp	Gly	Val	Lys	Arg	Leu	Glu	Glu	Leu	
				115					120	
Leu	Pro	Ala	Val	Ser	Ser	Gly	Lys	Asn	Ile	
				125					130	
Lys	Arg	Thr	Leu	Ala	Ala	Met	Pro	Glu	Glu	
				135					140	
Glu	Thr	Thr	Glu	Ala	Asn	Ala	Gly	Gln	Phe	
				145					150	
Leu	Ser	Phe	Ala	Ser	Leu	Phe	Leu	Pro	Lys	
				155					160	
Leu	Val	Val	Gly	Glu	Lys	Ala	Cys	Leu	Glu	
				165					170	
Lys	Val	Gln	Arg	Gln	Ile	Gln	Val	His	Ala	
				175					180	
Glu	Gln	Gly	Leu	Ile	Gln	Tyr	Pro	Thr	Ala	
				185					190	
Trp	Gln	Ser	Val	Gly	His	Met	Met	Val	Ile	
				195					200	
Phe	Arg	Leu	Met	Arg	Thr	Asn	Phe	Leu	Ile	
				205					210	
Lys	Phe	Leu	Leu	Ile	His	Gln	Gly	Met	His	
				215					220	
Met	Val	Ala	Gly	His	Asp	Ala	Asn	Asp	Ala	
				225					230	
Val	Ile	Ser	Asn	Ser	Val	Ala	Gln	Ala	Arg	
				235					240	
Phe	Ser	Gly	Leu	Leu	Ile	Val	Lys	Thr	Val	
				245					250	
Leu	Asp	His	Ile	Leu	Gln	Lys	Thr	Glu	Arg	
				255					260	
Gly	Val	Arg	Leu	His	Pro	Leu	Ala	Arg	Thr	

Ala Lys Val Lys	265	Asn Glu Val Asn Ser Phe	270
Lys Ala Ala Leu	275	Ser Ser Leu Ala Lys His	280
Gly Glu Tyr Ala	285	Pro Phe Ala Arg Leu Leu	290
Asn Leu Ser Gly	295	Val Asn Asn Leu Glu His	300
Gly Leu Phe Pro	305	Gln Leu Ser Ala Ile Ala	310
Leu Gly Val Ala	315	Thr Ala His Gly Ser Thr	320
Leu Ala Gly Val	325	Asn Val Gly Glu Gln Tyr	330
Gln Gln Leu Arg	335	Glu Ala Ala Thr Glu Ala	340
Glu Lys Gln Leu	345	Gln Gln Tyr Ala Glu Ser	350
Arg Glu Leu Asp	355	His Leu Gly Leu Asp Asp	360
Gln Glu Lys Lys	365	Ile Leu Met Asn Phe His	370
Gln Lys Lys Asn	375	Glu Ile Ser Phe Gln Gln	380
Thr Asn Ala Met	385	Val Thr Leu Arg Lys Glu	390
Arg Leu Ala Lys	395	Leu Thr Glu Ala Ile Thr	400
Ala Ala Ser Leu	405	Pro Lys Thr Ser Gly His	410
Tyr Asp Asp Asp	415	Asp Asp Ile Pro Phe Pro	420
Gly Pro Ile Asn	425	Asp Asp Asp Asn Pro Gly	430
His Gln Asp Asp	435	Asp Asp Asp Asn Pro Gly	440
450Asp Thr Thr		Ile Pro Asp Val Val Val Asp	445
460Pro Asp Asp		Gly Ser Tyr Gly Glu Tyr Gln	455
Ser Tyr Ser Glu	465	Asn Gly Met Asn Ala Pro	470
Asp Asp Leu Val	475	Leu Phe Asp Leu Asp Glu	480
Asp Asp Glu Asp	485	Thr Lys Pro Val Pro Asn	490
Arg Ser Thr Lys	495	Gly Gly Gln Gln Lys Asn	500
Ser Gln Lys Gly	505	Gln His Ile Glu Gly Arg	510
Gln Thr Gln Ser	515	Arg Pro Ile Gln Asn Val	520
Pro Gly Pro His	525	Arg Thr Ile His His Ala	530
Ser Ala Pro Leu	535	Thr Asp Asn Asp Arg Arg	540
Asn Glu Pro Ser	545	Gly Ser Thr Ser Pro Arg	550
	555		560

Met Leu Thr Pro Ile Asn Glu Glu Ala Asp
 565 570
 Pro Leu Asp Asp Ala Asp Asp Glu Thr Ser
 575 580
 Ser Leu Pro Pro Leu Glu Ser Asp Asp Glu
 585 590
 Glu Gln Asp Arg Asp Gly Thr Ser Asn Arg
 595 600
 Thr Pro Thr Val Ala Pro Pro Ala Pro Val
 605 610
 Tyr Arg Asp His Ser Glu Lys Lys Glu Leu
 615 620
 Pro Gln Asp Glu Gln Gln Asp Gln Asp His
 625 630
 Thr Gln Glu Ala Arg Asn Gln Asp Ser Asp
 635 640
 Asn Thr Gln Ser Glu His Ser Phe Glu Glu
 645 650
 Met Tyr Arg His Ile Leu Arg Ser Gln Gly
 655 660
 Pro Phe Asp Ala Val Leu Tyr Tyr His Met
 665 670
 Met Lys Asp Glu Pro Val Val Phe Ser Thr
 675 680
 Ser Asp Gly Lys Glu Tyr Thr Tyr Pro Asp
 685 690
 Ser Leu Glu Glu Glu Tyr Pro Pro Trp Leu
 695 700
 Thr Glu Lys Glu Ala Met Asn Glu Glu Asn
 705 710
 Arg Phe Val Thr Leu Asp Gly Gln Gln Phe
 715 720
 Tyr Trp Pro Val Met Asn His Lys Asn Lys
 730 Phe Met Ala Ile Leu Gln His His Gln
 <210> 19
 <211> 251
 <212> PRT
 <213> Ebola Zaire
 <400> 19
 Met Ala Lys Ala Thr Gly Arg Tyr Asn Leu
 1 5 10
 Ile Ser Pro Lys Lys Asp Leu Glu Lys Gly
 15 20
 Val Val Leu Ser Asp Leu Cys Asn Phe Leu
 25 30
 Val Ser Gln Thr Ile Gln Gly Trp Lys Val
 35 40
 Tyr Trp Ala Gly Ile Glu Phe Asp Val Thr
 45 50
 His Lys Gly Met Ala Leu Leu His Arg Leu
 55 60
 Lys Thr Asn Asp Phe Ala Pro Ala Trp Ser
 65 70
 Met Thr Arg Asn Leu Phe Pro His Leu Phe
 75 80
 Gln Asn Pro Asn Ser Thr Ile Glu Ser Pro
 85 90

725
 735

Leu Trp Ala Leu Arg Val Ile Leu Ala Ala	95	100
Gly Ile Gln Asp Gln Leu Ile Asp Gln Ser	105	110
Leu Ile Glu Pro Leu Ala Gly Ala Leu Gly	115	120
Leu Ile Ser Asp Trp Leu Leu Thr Thr Asn	125	130
Thr Asn His Phe Asn Met Arg Thr Gln Arg	135	140
Val Lys Glu Gln Leu Ser Leu Lys Met Leu	145	150
Ser Leu Ile Arg Ser Asn Ile Leu Lys Phe	155	160
Ile Asn Lys Leu Asp Ala Leu His Val Val	165	170
Asn Tyr Asn Gly Leu Leu Ser Ser Ile Glu	175	180
Ile Gly Thr Gln Asn His Thr Ile Ile Ile	185	190
Thr Arg Thr Asn Met Gly Phe Leu Val Glu	195	200
Leu Gln Glu Pro Asp Lys Ser Ala Met Asn	205	210
Arg Met Lys Pro Gly Pro Ala Lys Phe Ser	215	220
Leu Leu His Glu Ser Thr Leu Lys Ala Phe	225	230
Thr Gln Gly Ser Ser Thr Arg Met Gln Ser	235	240
Leu Ile Leu Glu Phe Asn Ser Ser Leu Ala	245	250
Ile		

<210> 20

<211> 324

<212> PRT

<213> Ebola Zaire

<400> 20

Met Glu Ala Ser Tyr Glu Arg Gly Arg Pro	1	5	10
Arg Ala Ala Arg Gln His Ser Arg Asp Gly	15		20
His Asp His His Val Arg Ala Arg Ser Ser	25		30
Ser Arg Glu Asn Tyr Arg Gly Glu Tyr Arg	35		40
Gln Ser Arg Ser Ala Ser Gln Val Arg Val	45		50
Pro Thr Val Phe His Lys Lys Arg Val Glu	55		60
Pro Leu Thr Val Pro Pro Ala Pro Lys Asp	65		70
Ile Cys Pro Thr Leu Lys Lys Gly Phe Leu	75		80
Cys Asp Ser Ser Phe Cys Lys Lys Asp His			

	85	90
Gln Leu Glu Ser	Leu Thr Asp Arg Glu Leu	
	95	100
Leu Leu Leu Ile	Ala Arg Lys Thr Cys Gly	
	105	110
Ser Val Glu Gln	Gln Leu Asn Ile Thr Ala	
	115	120
Pro Lys Asp Ser	Arg Leu Ala Asn Pro Thr	
	125	130
Ala Asp Asp Phe	Gln Gln Glu Glu Gly Pro	
	135	140
Lys Ile Thr Leu	Leu Thr Leu Ile Lys Thr	
	145	150
Ala Glu His Trp	Ala Arg Gln Asp Ile Arg	
	155	160
Thr Ile Glu Asp	Ser Lys Leu Arg Ala Leu	
	165	170
Leu Thr Leu Cys	Ala Val Met Thr Arg Lys	
	175	180
Phe Ser Lys Ser	Gln Leu Ser Leu Leu Cys	
	185	190
Glu Thr His Leu	Arg Arg Glu Gly Leu Gly	
	195	200
Gln Asp Gln Ala	Glu Pro Val Leu Glu Val	
	205	210
Tyr Gln Arg Leu	His Ser Asp Lys Gly Gly	
	215	220
Ser Phe Glu Ala	Ala Leu Trp Gln Gln Trp	
	225	230
Asp Leu Gln Ser	Leu Ile Met Phe Ile Thr	
	235	240
Ala Phe Leu Asn	Ile Ala Leu Gln Leu Pro	
	245	250
Cys Glu Ser Ser	Ala Val Val Val Ser Gly	
	255	260
Leu Arg Thr Leu	Val Pro Gln Ser Asp Asn	
	265	270
Glu Glu Ala Ser	Thr Asn Pro Gly Thr Cys	
	275	280
Ser Trp Ser Asp	Glu Gly Thr Ser Ile Gln	
	285	290
Gln Gln Leu Ala	Ser Cys Leu His Arg Thr	
	295	300
Arg Gly Asp Trp	His Ala Ala Leu Lys Phe	
	305	310
Leu Phe Tyr Phe	Ser Phe Leu Phe Arg Ile	
	315	320
Gly Phe Cys Phe		

<210> 21

<211> 340

<212> PRT

<213> Ebola Zaire

<400> 21

Met Thr Thr Arg Thr Lys Gly Arg Gly His

1	5	10	
Thr Ala Ala Thr	Thr Gln Asn Asp Arg Met		
15	20		
Pro Gly Pro Glu	Leu Ser Gly Trp Ile Ser		
25	30		
Glu Gln Leu Met	Thr Gly Arg Ile Pro Val		
35	40		
Ser Asp Ile Phe	Cys Asp Ile Glu Asn Asn		
45	50		
Pro Gly Leu Cys	Tyr Ala Ser Gln Met Gln		
55	60		
Gln Thr Lys Pro	Asn Pro Lys Thr Arg Asn		
65	70		
Ser Gln Thr Gln	Thr Asp Pro Ile Cys Asn		
75	80		
His Ser Phe Glu	Glu Val Val Gln Thr Leu		
85	90		
Ala Ser Leu Ala	Thr Val Val Gln Gln Gln		
95	100		
Thr Ile Ala Ser	Glu Ser Leu Glu Gln Arg		
105	110		
Ile Thr Ser Leu	Glu Asn Gly Leu Lys Pro		
115	120		
Val Tyr Asp Met	Ala Lys Thr Ile Ser Ser		
125	130		
Leu Asn Arg Val	Cys Ala Glu Met Val Ala	135	
140	Lys Tyr Asp Leu Leu Val Met Thr Thr Gly	145	
150			
Arg Ala Thr Ala	Thr Ala Ala Ala Thr Glu		
155	160		
Ala Tyr Trp Ala	Glu His Gly Gln Pro Pro		
165	170		
Pro Gly Pro Ser	Leu Tyr Glu Glu Ser Ala		
175	180		
Ile Arg Gly Lys	Ile Glu Ser Arg Asp Glu		
185	190		
Thr Val Pro Gln	Ser Val Arg Glu Ala Phe		
195	200		
Asn Asn Leu Asn	Ser Thr Thr Ser Leu Thr		
205	210		
Glu Glu Asn Phe	Gly Lys Pro Asp Ile Ser		
215	220		
Ala Lys Asp Leu	Arg Asn Ile Met Tyr Asp		
225	230		
His Leu Pro Gly	Phe Gly Thr Ala Phe His		
235	240		
Gln Leu Val Gln	Val Ile Cys Lys Leu Gly		
245	250		
Lys Asp Ser Asn	Ser Leu Asp Ile Ile His		
255	260		
Ala Glu Phe Gln	Ala Ser Leu Ala Glu Gly		
265	270		
Asp Ser Pro Gln	Cys Ala Leu Ile Gln Ile		
275	280		
Thr Lys Arg Val	Pro Ile Phe Gln Asp Ala		
285	290		
Ala Pro Pro Val	Ile His Ile Arg Ser Arg		

	295	300
Gly Asp Ile Pro Arg Ala Cys Gln Lys Ser		
	305	310
Leu Arg Pro Val Pro Pro Ser Pro Lys Ile		
	315	320
Asp Arg Gly Trp Val Cys Val Phe Gln Leu		
	325	330
Gln Asp Gly Lys Thr Leu Gly Leu Lys Ile		
	335	340

<210> 22

<211> 326

<212> PRT

<213> Ebola Zaire

<400> 22

Met Arg Arg Val Ile Leu Pro Thr Ala Pro	
1 5 10	
Pro Glu Tyr Met Glu Ala Ile Tyr Pro Val	
15 20	
Arg Ser Asn Ser Thr Ile Ala Arg Gly Gly	
25 30	
Asn Ser Asn Thr Gly Phe Leu Thr Pro Glu	
40Ser Val Asn Gly Asp Thr Pro Ser Asn Pro	
45 50	
Leu Arg Pro Ile Ala Asp Asp Thr Ile Asp	
55 60	
His Ala Ser His Thr Pro Gly Ser Val Ser	
65 70	
Ser Ala Phe Ile Leu Glu Ala Met Val Asn	
75 80	
Val Ile Ser Gly Pro Lys Val Leu Met Lys	
85 90	
Gln Ile Pro Ile Trp Leu Pro Leu Gly Val	
95 100	
Ala Asp Gln Lys Thr Tyr Ser Phe Asp Ser	
105 110	
Thr Thr Ala Ala Ile Met Leu Ala Ser Tyr	
115 120	
Thr Ile Thr His Phe Gly Lys Ala Thr Asn	
125 130	
Pro Leu Val Arg Val Asn Arg Leu Gly Pro	
135 140	
Gly Ile Pro Asp His Pro Leu Arg Leu Leu	
145 150	
Arg Ile Gly Asn Gln Ala Phe Leu Gln Glu	
155 160	
Phe Val Leu Pro Pro Val Gln Leu Pro Gln	
165 170	
Tyr Phe Thr Phe Asp Leu Thr Ala Leu Lys	
175 180	
Leu Ile Thr Gln Pro Leu Pro Ala Ala Thr	
185 190	
Trp Thr Asp Asp Thr Pro Thr Gly Ser Asn	
195 200	
Gly Ala Leu Arg Pro Gly Ile Ser Phe His	
205 210	

35

Pro Lys Leu Arg	Pro Ile Leu Leu Pro Asn	
	215	220
Lys Ser Gly Lys	Lys Gly Asn Ser Ala Asp	
	225	230
Leu Thr Ser Pro	Glu Lys Ile Gln Ala Ile	
	235	240
Met Thr Ser Leu	Gln Asp Phe Lys Ile Val	
	245	250
Pro Ile Asp Pro	Thr Lys Asn Ile Met Gly	
	255	260
Ile Glu Val Pro	Glu Thr Leu Val His Lys	
	265	270
Leu Thr Gly Lys	Lys Val Thr Ser Lys Asn	
	275	280
Gly Gln Pro Ile	Ile Pro Val Leu Leu Pro	
	285	290
Lys Tyr Ile Gly	Leu Asp Pro Val Ala Pro	
	295	300
Gly Asp Leu Thr	Met Val Ile Thr Gln Asp	
	305	310
Cys Asp Thr Cys	His Ser Pro Ala Ser Leu	315
320Pro Ala Val	Ile Glu Lys	
	325	

<210> 23

<211> 288

<212> PRT

<213> Ebola Zaire

<400> 23

Met Glu Ala Ser Tyr Glu Arg Gly Arg Pro	
1	5 10
Arg Ala Ala Arg Gln His Ser Arg Asp Gly	
	15 20
His Asp His His Val Arg Ala Arg Ser Ser	
	25 30
Ser Arg Glu Asn Tyr Arg Gly Glu Tyr Arg	
	35 40
Gln Ser Arg Ser Ala Ser Gln Val Arg Val	
	45 50
Pro Thr Val Phe His Lys Lys Arg Val Glu	
	55 60
Pro Leu Thr Val Pro Pro Ala Pro Lys Asp	
	65 70
Ile Cys Pro Thr Leu Lys Lys Gly Phe Leu	
	75 80
Cys Asp Ser Ser Phe Cys Lys Lys Asp His	
	85 90
Gln Leu Glu Ser Leu Thr Asp Arg Glu Leu	
	95 100
Leu Leu Leu Ile Ala Arg Lys Thr Cys Gly	
	105 110
Ser Val Glu Gln Gln Leu Asn Ile Thr Ala	
	115 120
Pro Lys Asp Ser Arg Leu Ala Asn Pro Thr	
	125 130
Ala Asp Asp Phe Gln Gln Glu Glu Gly Pro	

	135	140
Lys Ile Thr Leu	Leu Thr Leu Ile Lys Thr	
	145	150
Ala Glu His Trp	Ala Arg Gln Asp Ile Arg	
	155	160
Thr Ile Glu Asp	Ser Lys Leu Arg Ala Leu	
	165	170
Leu Thr Leu Cys	Ala Val Met Thr Arg Lys	
	175	180
Phe Ser Lys Ser	Gln Leu Ser Leu Leu Cys	
	185	190
Glu Thr His Leu	Arg Arg Glu Gly Leu Gly	
	195	200
Gln Asp Gln Ala	Glu Pro Val Leu Glu Val	
	205	210
Tyr Gln Arg Leu	His Ser Asp Lys Gly Gly	
	215	220
Ser Phe Glu Ala	Ala Leu Trp Gln Gln Trp	
	225	230
Asp Arg Gln Ser	Leu Ile Met Phe Ile Thr	
	235	240
Ala Phe Leu Asn	Ile Ala Leu Gln Leu Pro	
	245	250
Cys Glu Ser Ser	Ala Val Val Val Ser Gly	
	255	260
Leu Arg Thr Leu	Val Pro Gln Ser Asp Asn	
	265	270
Glu Glu Ala Ser	Thr Asn Pro Gly Thr Cys	275
280Ser Trp Ser	Asp Glu Gly Thr Pro	285
<210> 24<211> 11<212> PRT<213> Ebola Zaire<400> 24Val Tyr Gln Val Asn Asn Leu		
Glu Glu Ile		
1	5	10
Cys		

<210> 25

<211> 23

<212> PRT

<213> Ebola Zaire

<400> 25

Leu Lys Phe Ile Asn Lys Leu Asp Ala Leu

1 5 10

Leu Val Val Asn Tyr Asn Gly Leu Leu Ser

15 20

Ser Ile Phe

51